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**Landsat 7  
Operations Agreement (OA)  
Between the  
International Ground Stations (IGS)  
and Landsat 7**

**July 1998**



National Aeronautics and  
Space Administration

Goddard Space Flight Center  
Greenbelt, Maryland

# **Landsat 7 Operations Agreement (OA) Between the International Ground Stations (IGS) and Landsat 7**

**July 1998**

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# Preface

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This document was written by the AlliedSignal Technical Services Corporation (ATSC) Landsat 7 Flight Operations Team (FOT). It is intended to formalize the Operational Agreements between Landsat 7 and the International Ground Stations (IGS) for the Landsat 7 Mission.

This document is under the configuration management of the Landsat 7 Project Configuration Control Board (CCB).

Configuration Change Requests (CCRs) to this document shall be submitted to the Landsat 7 Project CCB, along with supportive material justifying the proposed change. Changes to this document shall be made by document change notice (DCN) or by complete revision.

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# DCN Control Sheet

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# Section 1. Introduction

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## 1.1 Purpose

This document specifies and controls the operational interface between International Ground Stations (IGSs) and Landsat 7. Its purpose is to clearly define activities between the IGS operators and the Landsat 7.

This agreement will become effective upon approval and will remain in effect throughout the operations phase of the Landsat 7 mission. Any subsequent changes to this document must be mutually agreed upon by the NOAA Mission Management Office (MMO), on behalf of the IGSs, by the Distributed Active Archive Center (DAAC), and by the Landsat 7 FOT.

## 1.2 Scope

This Operational Agreement (OA) covers the operational interfaces between the MOC personnel and the IGS personnel and between the IGS personnel and the EROS Data Center (EDC) Distributed Active Archive Center (DAAC) personnel.

## 1.3 Reference Documentation

The latest version of the documents listed below were used as references for the development of this OA or can be used for further information. Web page addresses, email addresses, or phone numbers are also included to facilitate easy access to the documents.

- a. Landsat 7 Detailed Mission Requirements (DMR) Document, 430-11-01-003-1  
<http://ls7pm3.gsfc.nasa.gov/document.html>
- b. Landsat 7 to IGS ICD, 430-11-06-009  
[http://ltpwww.gsfc.nasa.gov/IAS/pdfs/igs\\_icd\\_revb\\_feb98.pdf](http://ltpwww.gsfc.nasa.gov/IAS/pdfs/igs_icd_revb_feb98.pdf)
- c. Landsat 7 Flight Operations Plan (FOP), ATSC, MOSDD-L7-FOP-002  
<http://ls7pm3.gsfc.nasa.gov/document.html>
- d. IGS Memoranda of Understanding (available from the MMO)
- e. DAAC Operations Plan (document number TBS)  
User Services: 605-594-6116, [edc@eos.nasa.gov](mailto:edc@eos.nasa.gov)

## 1.4 Document Organization

This document consists of 10 sections:

Section 1 identifies the document purpose, scope, references, and organization.

Section 2 describes the facilities involved in the operational interfaces.

Section 3 addresses the Operational Responsibilities related to the MOC-IGS interface.

Section 4 addresses the Operational Responsibilities related to the MMO-IGS interface.

Section 5 addresses the Operational Responsibilities related to the DAAC-IGS interface.

Section 6 lists the relevant points of contact within the FOT and the conditions under which each should be used.

Section 7 lists the relevant points of contact within the IGS and the conditions under which each should be used.

Section 8 lists the relevant points of contact within the MMO and the conditions under which each should be used.

Section 9 lists the relevant points of contact within the DAAC and the conditions under which each should be used.

Section AB defines the abbreviations and the acronyms.

## **Section 2. Facilities Description**

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### **2.1 The Mission Operations Center (MOC)**

The Landsat 7 MOC, located in Building 32 at GSFC, Greenbelt, Maryland, is developed by NASA and provides the hardware and software systems necessary for the successful execution of real-time spacecraft operations and off-line scheduling and analysis activities. All command and control functions of the spacecraft take place in the MOC. From the MOC, the Flight Operations Team (FOT) ensures that spacecraft conditions are monitored and controlled. Along with ensuring the health and safety of the spacecraft, the FOT schedules and executes science data capture and retrieval. The FOT, using MOC tools, facilitates resource scheduling and interfaces with the appropriate elements required to conduct mission operations and meet the mission objective.

### **2.2 The Mission Management Office (MMO)**

The Landsat Management Plan, signed by the tri-agency Landsat Program Management (LPM), assigns management responsibility for Landsat 7 on-orbit operations to NOAA. To carry out its responsibility, NOAA has established the Mission Management Office (MMO) to plan and direct those activities. The MMO acts on behalf of the Landsat Coordinating Group (LCG), which consists of senior agency officials at NASA, NOAA, and USGS who oversee the Landsat Program.

The Landsat 7 MMO is charged with implementation of the Landsat 7 Data Policy. In this capacity, the MMO is responsible for the day-to-day operations of the Landsat 7 System to fulfill that policy. The MMO establishes and maintains agreements with the IGSs for providing direct downlink Landsat 7 ETM+ data, provides for appropriate operational coordination, and acts as a point of contact for non-routine communications with the IGSs. Routine contacts with the IGSs are delegated by the MMO to the Landsat 7 FOT.

### **2.3 Distributed Active Archive Center (DAAC)**

The Distributed Active Archive Center (DAAC) is an element of the Earth Observing System Data and Information System (EOSDIS). It is located in Sioux Falls, South Dakota, at the Earth Resources Observation System (EROS) Data Center (EDC). For Landsat 7, the DAAC archives and distributes Landsat 7 Level 0R data, metadata, and browse data. The DAAC supports user queries and distributes data to users. It maintains an on-line library of metadata and browse data for Landsat 7. The IGSs send metadata and (optionally) browse data to the DAAC for inclusion in this library. The DAAC also maintains a library of calibration parameters and mission information for Landsat 7.

## 2.4 The International Ground Stations (IGSs)

In addition to downlinking X-band image data to U.S. facilities, the Landsat 7 spacecraft also downlinks image data to the IGSs. These stations receive real-time image data only as acquired within their acquisition circle. Each IGS signs a Memorandum of Understanding (MOU) with NOAA which specifies certain terms of agreement relating to the scheduling and operations affecting their access to image data downlinks. A list of possible IGSs is shown in Table 2-1.

**Table 2-1: Potential IGS List**

<b>SYMBOL</b>	<b>LOCATION</b>	<b>COMMENTS</b>
COA	Argentina, Cordoba	
ASA	Australia, Alice Springs	scheduled through ACRES (Canberra)
HOA	Australia, Hobart	scheduled through ACRES (Canberra)
CUB	Brazil, Cuiaba	
GNC	Canada, Gatineau	scheduled through Ottawa
PAC	Canada, Prince Albert	scheduled through Ottawa
CPE	Ecuador, Cotopaxi	
LBG	Gabon, Libreville	
NSG	Germany, Neustrelitz	scheduled through ESA (Fucina)
DKI	Indonesia, Parepare	
FUI	Italy, Fucino	scheduled through ESA (Fucina)
HAI	Japan, Hatoyama	scheduled through NASDA (Hatoyama)
KUJ	Japan, Kumamoto	scheduled through NASDA (Hatoyama)
KLM	Malaysia, Kuala Lumpur	
ISP	Pakistan, Islamabad	
BJC	Peoples Rep. of China, Beijing	
UPR	Puerto Rico, University of	
RSA	Saudi Arabia, Riyadh	
SGP	Singapore	
JSA	South Africa, Johannesburg	
KIS	Sweden, Kiruna	scheduled through ESA (Fucina)
CLT	Taipei, China, Chung-li	
BKT	Thailand, Bangkok	

## Section 3. Operational Responsibilities - MOC

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### 3.1 Products

During on-orbit operations, the IGSs request image acquisition via Service Requests sent to the Landsat 7 open file server located in the MOC. A unique user ID and password will be assigned to each IGS to access the MOC open server as part of the new station start-up procedure. The Service requests from the IGSs are ingested by the MOC Scheduling system, and incorporated into the Scheduler acquisition request database. These requests are honored as system resources allow. Conflicts are resolved in a manner agreed to by the MMO and the IGSs (see Section 4.7). The Landsat 7 spacecraft's ETM+ sensor is duty cycle limited by thermal and power constraints which could also preclude the honoring of IGS imaging requests.

Several products are exchanged between the IGSs and the FOT in the MOC. Table 3-1 lists the product descriptions, timespans, and delivery frequency. The product numbers assigned to each product in Table 3-1 are utilized by the MOC for product accountability and tracking purposes only.

### 3.2 Use of Administrative Messages

The Administrative Message will be utilized by both the MOC and IGSs to notify each other of anomalous conditions and to pass information not covered by other message types. The following list outlines the major reasons for which the MOC might send an Administrative Message:

- a. Delay in Contact Schedule file updates
- b. Notice of Calibration Parameters File update
- c. Notice of system and spacecraft status

The MOC will notify each IGS of a spacecraft contingency, spacecraft emergency, or planned maneuvers that affect imaging, using the Administrative Message. It is the responsibility of each IGS to poll the MOC server every day to ensure timely notification of possible non-imaging periods. For time critical messages, an e-mail version of the Administrative Message is sent to each IGS in addition to the message placed on the server. The e-mail address to be used is listed in Section 7.

**Table 3-1: Product Descriptions - MOC / IGS**

<b>Product # and Description</b>	<b>From/ To</b>	<b>Product Description</b>	<b>Product Timespan</b>	<b>Delivery Frequency</b>
3.03 STATION DESCRIPTION	IGSs to FOT	Provides FOT with information about ground station location and points of contact	Not Applicable (N/A)	Once before station startup, as baseline; updates as required, at least 7 days prior to effective date
3.02 RECEIVE ANTENNA HORIZON MASK	IGSs to FOT	Provides minimum elevation angles for unobstructed line of sight to satellite	N/A	Once before station startup, as baseline; updates as required, at least 7 days prior to effective date
3.09 SERVICE REQUEST	IGSs to FOT	Requests FOT to schedule transmission to ground station	Up to 10 imaging intervals	At least 36 hours prior to start of requested acquisition(s)
1.11 CONTACT SCHEDULE	FOT to IGSs	Notifies the station of scheduled X-band on/off times	48 hours	After every scheduling run that included a request from that ground station
2.05 • IIRV • BME, NORAD	FOT to IGSs	<ul style="list-style-type: none"> <li>• LS7 position and velocity vectors</li> <li>• LS7 orbital elements</li> </ul> Both types are for ground station use in pointing to LS7	<ul style="list-style-type: none"> <li>• nominally 72 hours or 96 hours</li> <li>• single vector</li> </ul>	<ul style="list-style-type: none"> <li>• Mondays (72 hrs), Wednesdays (72 hrs), and Fridays (96 hrs)</li> <li>• Daily</li> </ul>
3.05 PROBLEM REPORT	IGSs to FOT	Used to report potential satellite related problems during downlink receipt	N/A	Within 24 hours of detection of problem
3.08 a & b resp. ADMINISTRATIVE MESSAGE	IGSs to FOT, FOT to IGSs	Free form information not covered by other messages/files	N/A	As needed
FORMATS Product Report	FOT to IGSs	Acknowledgment of receipt and ingest of IGS inbound files, and validation of service requests	N/A	Within 5 minutes of product receipt
3.01 CALIBRATION PARAMETER FILE	FOT to IGSs	Provides geometric and radiometric parameters for image processing	Nominally 90 days	Once before launch, updates nominally every 90 days

### 3.3 Retrieval of Files From the MOC

Files to be sent to the IGSs are placed on the MOC open server in the appropriate IGS output directory. It is the responsibility of each IGS to log onto the Landsat 7 file server daily and retrieve any files generated for the station, including the Contact Schedule and IIRV/BME/NORAD files.

It is recommended that each IGS poll its directory on the MOC open server each day before the first contact with the satellite to ensure no updated Contact Schedules have been generated.

The FOT nominally places the updated Contact Schedule and vector files on the MOC open server within a set two-hour window each day. The two-hour window opens at 2000Z and closes at 2200Z every day during normal operations.

#### 3.3.1 File Retrieval Instructions

The following are the steps to be followed in retrieving files from the MOC open server:

1. Establish an ftp connection to the host using the Domain name and IP address
2. Once connected, enter your User name and Password
3. Change to the directory specified in section 3.3.2 for your site and the file type you wish to retrieve
4. Use the ftp "get" command to retrieve files from the MOC
5. When you have finished, use the ftp "bye" command to exit from ftp

#### 3.3.2 IP Address and Directory Information

The specific IP address and directory information to retrieve products from the MOC are:

- a. Products Directories for:  
**Contact Schedule (1.11)**  
**IIRV, BME, NORAD (2.05)**  
**Calibration Parameter File (3.01)**  
**Administrative Message from FOT (3.08b)**

IP Address: (see section 3.5)

Domain Name: (see section 3.5)

User Name: **ID**

Password: (see section 3.5)

Directory Structure:

C:\LS7\ProductRepository\Outbound\Station\**Country**\**ID**\Products

Note: See table 3-2 for **Country** and **ID** values



- b. Products Directories for:

**FORMATS Product Report**

IP Address: (see section 3.5)

Domain Name: (see section 3.5)

User Name: **ID**

Password: (see section 3.5)

Directory Structure:

C:\LS7\ProductRepository\Outbound\Station\Country\ID\Reports

Note: See table 3-2 for **Country** and **ID** values

***Table 3-2: Country and ID Directory Paths***

Country	ID
Argentina	COA
Australia	ASA
Australia	HOA
Brazil	CUB
Canada	GNC
Canada	PAC
Ecuador	CPE
Gabon	LBG
Germany	NSG
Indonesia	DKI
Italy	FUI
Japan	HAI
Japan	KUJ
Malaysia	KLM
Pakistan	ISP
PeoplesRepublicofChina	BJC
SaudiArabia	RSA
Singapore	SGP
SouthAfrica	JSA
Sweden	KIS
TaipeiChina	CLT
Thailand	BKT
UniversityofPuertoRico	UPR

### 3.4 Sending of Files to the MOC

Files to be sent to the MOC are transferred to the MOC open server using file transfer protocol (ftp) and are placed in the appropriate IGS input directory. There are a few timing considerations:

- The IGS Service Request message must be received by the MOC no later than 36 hours before the requested image acquisition start time(s).
- The MOC requires 7 days to incorporate Station Description changes.

The MOC software generates a FORMATS Product Report within 5 minutes of receipt of a file from an IGS. The report acknowledges receipt and successful transfer of the IGS file into the MOC. It also reports on results of validating Service Request messages. If the service request message fails validation, appropriate warnings and/or errors will be reported. Each warning/error contains a statement in brackets which begins with “message.” A portion of a sample report is found in Figure 3-1. Table 3-3 includes some of these error statements and describes the appropriate actions to be taken by the IGS.

```
FORMATS Product Report

L71998111PACREQ.S01xRPT
Date Generated: 1998:111:16:50:27

Product: 309_SVCREQ
Incoming File: L71998111PACREQ.S01

Message  Message
Type
INFO L71998111PACREQ.S01 received by Transform.
WARN [messages.wrongScIdLbl1] (template line 96 input file line 14
      offset 398): We were hoping to see next the <S/C> part of the
      spacecraft ID label, but instead we read <TYP>.
WARN [messages.wrongScIdLbl2] (template line 102 input file line 14
      offset 400): We expected here to see <ID:> part of the spacecraft
      ID label, but instead we read the characters <E>:.
WARN [messages.wrongScId] (template line 108 input file line 14 offset
      422): We expected here to see <7> as the spacecraft id value but
      instead we saw <R>.
WARN [messages.startPathLabel1Check] (template line 113 input file
      line 14 offset 424): Text ( messages.startPathLabel1:EQ,EQI,
      'START') failed;
WARN [messages.startPathLabel2Check] (template line 115 input file
      line 16 offset 431): Text ( messages.startPathLabel2:'S/C',EQI,
      'PATH:') failed;
ERROR [messages.startPathRangeCheck] (template line 117 input file line
      16 offset 435): Numeric ( messages.startPath:'ID:',GE,1) failed,
      AND, Numeric ( messages.startPath:'ID:',LE,233) failed;

Error count = 27
Warning count = 70
Total Messages = 99
```

**Figure 3-1: Sample FORMATS Product Report with Warning/Error Messages**

**Table 3-3: FORMATS Product Report - Appropriate IGS Actions for Reported Warnings/Errors**

<b>Reported Warning/Error Statement</b>	<b>Appropriate IGS Action</b>
wrongScIdLbl1 wrongScIdLbl2	make sure the next line after DTG (for the first or only request) or after REQ. TYPE (for subsequent stacked requests) is correctly labeled "S/C ID:"
wrongScId	check that the value for S/C ID is "7"
startPathLabel1Check startPathLabel2Check	make sure the next line after S/C ID is correctly labeled "START PATH:"
startPathRangeCheck	check that the value for START PATH is between 1 and 233, inclusive
startRowLabel1Check startRowLabel2Check	make sure the next line after START PATH is correctly labeled "START ROW:"
startRowRangeCheck	check that the value for START ROW is between 1 and 248, inclusive
stopRowLabel1Check stopRowLabel2Check	make sure the next line after START ROW is correctly labeled "STOP ROW:"
stopRowRangeCheck	check that the value for STOP ROW is between 1 and 248, inclusive; if the range spans row 248 to row 1 (e.g. 246 thru 10), you must enter two requests: one for the range up through 248 and the other beginning at row 1 (e.g. 246 thru 248 and 1 thru 10)
startRowExceedsStopRow	check that the value for START ROW is less than the value for STOP ROW
effectiveDateLabel1Check effectiveDateLabel2Check	make sure the next line after STOP ROW is correctly labeled "EFFECTIVE DATE:"
effectDateFormatCheck	ensure the value for EFFECTIVE DATE is in the format yyyy-mm-dd; where yyyy is the year (1997 - 2100), mm is the month (01 - 12), and dd is the day (01 - 31)
expirationDateLabel1Check expirationDateLabel2Check	make sure the next line after EFFECTIVE DATE is correctly labeled "EXPIRATION DATE:"
expirDateFormatCheck	ensure the value for EXPIRATION DATE is in the format yyyy-mm-dd; where yyyy is the year (1997 - 2100), mm is the month (01 - 12), and dd is the day (01 - 31)
acqRateLabel1Check acqRateLabel2Check	make sure the next line after EXPIRATION DATE is correctly labeled "ACQ. RATE:"
acqRateRangeCheck	check that the value for ACQ. RATE is either "0" or "1"
minimumGapLabel1Check minimumGapLabel2Check	make sure the next line after ACQ. RATE is correctly labeled "MINIMUM GAP:"
minimumGapRangeCheck	check that the value for MINIMUM GAP is between 0 and 366, inclusive; note that the instrument limit is 85 for daytime scenes and that a value of 90 signals the scheduler software that a night scene is being requested and sun angle should be ignored
maxSolarZenithLbl1Check maxSolarZenithLbl2Check maxSolarZenithLbl3Check maxSolarZenithLbl4Check	make sure the next line after MINIMUM GAP: is correctly labeled "MAX. SOLAR ZENITH ANGLE:"
getMaxSolarZenithAngle.maxSolarZenithRangeCheck	check that the value for MAX. SOLAR ZENITH ANGLE is between 0 and 90
reqTypeLabel1Check reqTypeLabel2Check	make sure the next line after MAX. SOLAR ZENITH ANGLE: is correctly labeled "REQ. TYPE:"
wrongReqTypeSize	ensure the entry for REQ. TYPE is 3 characters
rqstTypeWrong	make sure the entry for REQ. TYPE matches the 3 letter IGS name found in the file name

### 3.4.1 File Transfer Instructions

The following are the steps to be followed in sending files to the MOC open server:

1. Establish an ftp connection to the host using Domain name and IP address
2. Once connected, enter your User name and Password
3. Change to the directory specified in section 3.3.2 for your site
4. Use the ftp "put" command to transfer files to the MOC
5. When you have finished, use the ftp "bye" command to exit from ftp

### 3.4.2 IP Address and Directory Information

The specific IP address and directory information to transmit products to the MOC are:

Product Directory for:

**Receive Antenna Horizon Mask (3.02)**

**Station Description (3.03)**

**Problem Report (3.05)**

**Administrative Message from IGS (3.08a)**

**Service Request (3.09)**

IP Address: (see section 3.5)

Domain Name: (see section 3.5)

User Name: **ID**

Password: (see section 3.5)

Directory Structure:

C:\LS7\ProductRepository\Inbound\Station\**Country**\ID\Products

Note: See table 3-2 for **Country** and **ID** values

## 3.5 Handling of Sensitive Data

Sensitive data related to the interface between the MOC and the IGSs are the user account password, domain name, and IP address. These are specified in a separate attachment to this document. Each station, after signing on to become a Landsat 7 IGS, is sent a private attachment containing the sensitive data items required by the IGS to access the MOC open server. The sensitive data is sent via a postal service and will not be sent electronically. The address provided by the IGSs in Section 7 is used.

Passwords will be updated periodically via an update to the attachment. The update will be sent in the same manner as the original attachment.

## 3.6 ftp Examples

### 3.6.1 Typical "put" ftp Session with the MOC

```
>ftp <Enter Domain name here>  
Username: <Enter User name here>  
Password: <Enter Password here>  
>cd /LS7/ProductRepository/Inbound/Station/<country name>/<3-letter station ID>/Products  
>put <Filename>  
... once transfer is complete ...  
>bye
```

### 3.6.2 Typical "get" ftp Session with the MOC

```
>ftp <Enter Domain name here>  
Username: <Enter Username here>  
Password: <Enter Password here>  
>cd /LS7/ProductRepository/Outbound/Station/<country name>/<3-letter station ID>/Products  
>put <File name>  
... once transfer is complete ...  
>bye
```

## 3.7 MOC Transfer Problem Resolution

There are several steps that can be taken if you are having problems:

1. Contact your local system administrator if you have any questions about your workstation/PC.
2. "Ping" the Landsat 7 MOC address to which you want to ftp. If you cannot ping the Landsat MOC, your workstation/PC is not correctly connected to the network and you should contact your local system administrator. If you are not familiar with ping, contact your local system administrator.
3. Initiate your ftp session with the MOC. If you can connect to the MOC, but cannot access the correct directory or cannot "put" or "get" files, contact the Landsat 7 FOT using the phone numbers in Section 6.

## **Section 4. Operational Responsibilities - MMO Interface**

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### **4.1 Introduction**

The MMO is responsible for overseeing the Landsat 7 on-orbit operations after launch plus 60 days. The MMO is responsible for the day-to-day operations of the overall Landsat 7 system, from spacecraft to ground system, to fulfill the Landsat 7 Data Policy Plan. The MMO, acting on behalf of the Landsat Coordinating Group (LCG), interacts with the IGSs to establish and maintain operational agreement for direct downlink of Landsat 7 ETM+ data. The MMO provides operational coordination and resolves programmatic level issues to ensure the success of the Landsat 7 Mission. The areas of the Landsat 7 to IGS interface in which the MMO has operational responsibilities include:

- Start-up of new stations
- IGS Memorandum of Understanding
- IGS Operations Agreement
- Billing and accounting
- Anomaly resolution
- Schedule conflict resolution

These are discussed in more detail in the following sections. The points of contact for the MMO are listed in Section 8.

### **4.2 Start-up of New Stations**

The MMO provides to each new IGS the information required to implement a Landsat 7 data receiving and processing station. This information includes:

- Radio frequency (RF) interface description, including antenna frequencies and downlink specifications
- data and message formats, including interfaces back to the MOC and the DAAC
- hardware and software requirements imposed by data format or satellite design
- test data for use in station checkout

When an IGS signs up to become a Landsat 7 station, they are given the information required to access the servers at the MOC and the DAAC. This access will enable the exchange of test messages and test data files prior to the station coming on-line for routine operations. An important part of the start-up process is the submission of the Station Description and Receive

Antenna Horizon Mask messages by the IGS to the MOC. These messages enable the MOC and the DAAC to prepare for both testing and routine operations with the station.

### **4.3 IGS Memorandum of Understanding**

Acting on behalf of the Landsat Coordinating Group (LCG), the MMO negotiates with the IGSs to establish and maintain operational agreements for direct downlink of Landsat 7 ETM+ data. The Memorandum of Understanding (MOU) is the formal vehicle for this bilateral agreement between NOAA and the IGS, detailing responsibilities for each party and any costs involved. The MMO works with the IGS to resolve any issues related to the MOU between the NOAA and the IGS.

### **4.4 IGS Operations Agreement**

The MMO provides operational coordination and resolves programmatic level issues to ensure the success of the Landsat 7 mission. In this role, it acts on behalf of the IGSs in establishing an Operations Agreement (OA) with the three facilities that interface with the IGSs during operations: the MOC, the DAAC, and the MMO. The MMO is also the point of contact for non-routine communication with the IGSs. The IGSs are encouraged to first use the routine interface channels identified in the Operations Agreement to resolve any problem. These channels include the Problem Report, the Administrative Message, and direct contact with the FOT or DAAC.

### **4.5 Billing and Accounting**

The MMO is responsible for setting up billing and accounting for access fees from the IGSs. Billing and accounting information is provided to the IGSs each quarter.

### **4.6 Anomaly Resolution**

Any anomaly related to the direct downlink of Landsat 7 ETM+ data that cannot be resolved through the routine communications channels is directed to the MMO for resolution.

### **4.7 Schedule Conflict Resolution**

It is possible for conflicts to arise during the scheduling process due to resource constraints. For the most part, these can be dealt with fairly by the Mission Planners using the Scheduling System software. If for some reason a conflict occurs that cannot be resolved by routine procedures, for example due to special IGS data acquisition requirements, the MMO will provide a mutually agreeable resolution in accordance with the MOU and the OA.

### **4.8 Landsat 7 Ground Station Operators Working Group (LGSOWG)**

The MMO organizes and chairs the LGSOWG in accordance with Section 2.C of the MOU. The LGSOWG serves as a forum for exchange of programmatic, management, and technical information among ground station operators and the MMO. The IGSs designate their responsible representatives to participate in the LGSOWG which convenes annually at a location determined by the members.

At the LGSOWG, each IGS representative has an opportunity to provide a Station Status Report. The content of the report includes, but is not limited to, the following:

- a. Station Information: location, equipment, governing organizations, points of contact.
- b. Current and Planned Data Acquisition Activities: Landsat 7 and other data the station is collecting or plans to collect.
- c. Summary of Landsat 7 X-band downlink statistics and quality.
- d. Statistical Summary of Acquired Landsat 7 Scenes: cloud cover percentages, user request rate and scene refresh rate.
- e. Summary of the Station's Landsat 7 Data Archive: archive equipment and procedures, total number of scenes archived; percentage of good quality scenes with acceptable cloud cover and percentage of coverage of the IGS nation's landmass per season.
- f. Landsat 7 Data Distribution Activities: how the system works, order interfaces, equipment, staff, customer information and support, data delivery summary by format and media.

The LGSOWG has authorized the establishment of a subgroup, the Landsat Technical Working Group (LTWG), to address technical issues related to the operation of Landsat ground stations. Each signatory Landsat ground station and NOAA as the satellite operating agency provide technically-oriented representatives to the LTWG. The LTWG meets as a group twice a year; subcommittees may meet or work on selected topics in between these plenary sessions. Reports are made to the LGSOWG at the annual meeting. Issues that have been addressed in the past by the LTWG include:

- the Interface Control Document between the ground stations and the satellite operator
- the current satellite status and future plans
- results of calibration studies and data quality analyses
- archive strategies, including restoration of old media
- data and product exchange philosophies and formats
- problems or artifacts encountered during downlinks or during data processing



## Section 5. Operational Responsibilities - DAAC Interface

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### 5.1 Products

There are two primary products (metadata and browse data) and six files associated with the transfer protocol.

The IGSs send metadata to the DAAC for all Landsat 7 data they receive and archive. In accordance with the Memorandum of Understanding (MOU), metadata is sent to the DAAC on at least a monthly basis. The IGSs may also send browse data to the DAAC if they don't have an online browse archive at their facilities.

The protocol for the electronic transfer of metadata to the DAAC comprises these three files:

- Product Delivery Record (PDR) - accompanies the product from the IGS to the DAAC and describes the source, contents, and internal labeling of the product.
- PDR Discrepancy - returned to the IGS from the DAAC only if a problem is found during ingest of the PDR; may also be called PDRD by the DAAC
- Production Acceptance Notification (PAN) - returned to the IGS from the DAAC to announce status of each submitted product file: whether successfully archived or if not, what error were encountered.

The protocol for the physical media transfer of metadata and browse data to the DAAC comprises these three files:

- Physical Media Product Delivery Record (PMPDR) - accompanies the product from the IGS to the DAAC and describes the source, contents, and internal labeling of the product.
- Physical Media PDR Discrepancy - returned to the IGS from the DAAC only if a problem is found during ingest of the PDR; may also be called PMPDRD by the DAAC
- Physical Media Production Acceptance Notification (PMPAN) - returned to the IGS from the DAAC to announce status of each submitted product file: whether successfully archived or if not, what errors were encountered.

Table 5-1 summarizes the products and some of their characteristics.

**Table 5-1: Product Descriptions - DAAC / IGS**

<b>Product</b>	<b>From/ To</b>	<b>Product Description</b>	<b>Delivery Medium</b>	<b>Delivery Frequency</b>
Metadata	IGS to DAAC	Provides information about each ETM+ scene acquired	Electronic (ftp), Physical media	At least once a month
Browse data	IGS to DAAC	Reduced volume representation of an image scene used to determine general ground area coverage and spatial relationships	Physical media	At least once a month (optional product)
PDR	IGS to DAAC	Describes source, contents, and internal labeling of the product	Electronic (ftp)	Delivered with the metadata product
PDR Discrepancy	DAAC to IGS	Reports problems found during processing of the PDR	E-mail	As required
PAN	DAAC to IGS	Reports processing status for every metadata file submitted to the DAAC	E-mail	After ingest processing of each delivery
PMPDR	IGS to DAAC	Describes source, contents, and internal labeling of the product	Physical Media, Hard Copy	Delivered with the metadata or browse data product
PMPDR Discrepancy	DAAC to IGS	Reports problems found during processing of the PDR	E-mail	As required
PMPAN	DAAC to IGS	Reports processing status for every metadata and browse data file submitted to the DAAC	E-mail	After ingest processing of each delivery

## **5.2 Sending Electronic Files to the DAAC**

Metadata files are the only product electronically transferred to the DAAC. The metadata file(s) and associated Product Delivery Record file are sent to the staging server from the IGS using file transfer protocol (ftp). They are placed in the appropriate IGS input directories.

The DAAC operator can set a parameter indicating the number of attempts that will be made to pull data from the staging server before reporting a transfer error. This number is currently set at four (4).

### **5.2.1 File Transfer Instruction**

The following are the steps to be followed in sending files to the DAAC staging server:

1. Establish an ftp connection to the host using Domain name and IP address
2. Once connected, enter your User name and Password
3. Change to the metadata directory specified in section 5.2.2 for your site

4. Use the ftp "put" command to transfer metadata files to the DAAC
5. Change to the PDR directory specified in section 5.2. for your site
6. Use the ftp "put" command to transfer the PDR file(s) to the DAAC
7. When you have finished, use the ftp "bye" command to exit from ftp

### 5.2.2 IP Address and Directory Information

The specific IP address and directory information to transmit files to the DAAC are:

- a. Product Directory for:

#### **Metadata files**

IP Address: (see section 5.5)

Domain Name: (see section 5.5)

User Name: TBD

Password: (see section 5.5)

Directory structure: /IGS/META/**ID**/DATA

Note: See table 3-2 for **ID** values

- b. Product Directory for:

#### **PDR Files**

IP Address: (see section 5.5)

Domain Name: (see section 5.5)

User Name: TBD

Password: (see section 5.5)

Directory structure: /IGS/META/**ID**/PDR

Note: See Table 3-2 for **ID** values

### 5.2.3 Typical "put" ftp Session with the DAAC

```
>ftp M0Cxxxx
```

```
Username: <Enter Username here>
```

```
Password: <Enter Password here>
```

```
>cd /IGS/META/<3-letter station ID>/DATA
```

```
>put <File name>
```

```
... once transfer of metadata files is complete ...
```

```
>cd /IGS/META/<3-letter station ID>/PDR
```

>put <File name>

... once transfer of PDR file(s) is complete ...

>bye

#### **5.2.4 DAAC Transfer Problem Resolution**

There are several steps that can be taken if you are having problems:

1. Contact your local system administrator if you have any questions about your workstation/PC.
2. "Ping" the DAAC address to which you want to ftp. If you cannot ping the DAAC, your workstation/PC is not correctly connected to the network and you should contact your local system administrator. If you are not familiar with ping, contact your local system administrator.
3. Initiate your ftp session with the DAAC. If you can connect to the DAAC, but cannot access the correct directory or cannot "put" files, contact the DAAC operations personnel using the phone numbers in Section 9.

### **5.3 Sending Physical Media to the DAAC**

Both metadata files and browse data files can be transferred to the DAAC via physical media. The standard medium will be 8mm cartridge tape, however, the DAAC can also support 4mm digital audio tape. A browse data submission must include the associated metadata files. A single Product Delivery Record file is included on each tape.

In the event that a file check on the tape by the DAAC reveals that the PDR file is missing, DAAC operations personnel will contact the appropriate IGS operations personnel (in accordance with Section 7) and request a hard copy of the PDR be sent by facsimile to the DAAC. The facsimile phone number for the DAAC is listed in Section 9.

If a tape cannot be read at all, the DAAC operations personnel will notify the MMO and pass on to them any available details for use by the IGS in resolving the problem and submitting a replacement tape.

The information required on the paper label attached externally to the tape includes:

- Names of the files on the tape, in the order they were written to the tape
- Date of media shipment
- Unique media ID

The mailing address for sending physical media to the DAAC is in Section 9.

## 5.4 Receiving e-mail Files from the DAAC

Files are sent from the DAAC to the IGSs via e-mail. The actual file name of the PDR Discrepancy or PAN file is placed in the subject line of the e-mail message. The body of the e-mail message contains the file as defined in the Landsat 7 to IGS ICD.

## 5.5 Appropriate IGS Actions for Reported Dispositions

The files sent from the DAAC contain dispositions of metadata and browse data files sent by the IGS for processing and archival at the DAAC. Tables 5-2 through 5-9 describe the appropriate actions to be taken by the IGS for each disposition defined in the Landsat 7 to IGS ICD for the eight file types:

- Short PDR Discrepancy
- Long PDR Discrepancy
- Short PAN
- Long PAN
- Short Physical Media PDR Discrepancy
- Long Physical Media PDR Discrepancy
- Short PMPAN
- Long PMPAN

**Table 5-2: Short PDR Discrepancy - Appropriate IGS Actions for Reported Dispositions**

Reported Disposition	Appropriate IGS Action
INVALID FILE COUNT	<ul style="list-style-type: none"><li>• make sure the parameter TOTAL_FILE_COUNT agrees with the number of files being submitted with this PDR (do not include the PDR in your count);</li><li>• correct and resubmit the PDR and the original files</li></ul>
ECS INTERNAL ERROR	TBD
DATABASE FAILURES	TBD
INVALID PVL STATEMENT	<ul style="list-style-type: none"><li>• check all statements in the PDR for correct format and syntax;</li><li>• correct and resubmit the PDR and the original files</li></ul>
MISSING OR INVALID ORIGINATING_SYSTEM PARAMETER	<ul style="list-style-type: none"><li>• make sure the value for ORIGINATING_SYSTEM is set to <b>IGSxxx</b> where xxx is the 3-letter ID for your station as listed in Table 3-2;</li><li>• correct and resubmit the PDR and the original files</li></ul>
DATA PROVIDER REQUEST THRESHOLD EXCEEDED	TBD
DATA PROVIDER VOLUME THRESHOLD EXCEEDED	TBD
SYSTEM REQUEST THRESHOLD EXCEEDED	TBD
SYSTEM VOLUME THRESHOLD EXCEEDED	TBD

**Table 5-3: Long PDR Discrepancy - Appropriate IGS Actions for Reported Dispositions**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
INVALID DATA TYPE	<ul style="list-style-type: none"> <li>• make sure the value for DATA_TYPE is set to <b>L7IGS</b>;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID DIRECTORY	<ul style="list-style-type: none"> <li>• make sure the value for DIRECTORY_ID is set to <b>IGS/META/xxx/DATA</b> where xxx is the 3-letter ID for your station as listed in Table 3-2;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID FILE SIZE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_SIZE accurately reflects the size(s) of the associated metadata file(s);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID FILE ID	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_ID accurately reflects the name(s) of the metadata file(s) associated with the PDR;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID NODE NAME	<ul style="list-style-type: none"> <li>• make sure the value for NODE_NAME is set to <b>MOCxxxx</b> ;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID FILE TYPE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_TYPE accurately reflects whether the associated metadata file has both format 1 and 2 data in it (value should be set to <b>METADATA0</b>), only format 1 data in it (value should be set to <b>METADATA1</b>), only format 2 data in it (value should be set to <b>METADATA2</b>);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>

**Table 5-4: Short PAN - Appropriate IGS Actions for Reported Dispositions**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
SUCCESSFUL	• no action required
NETWORK FAILURE	TBD
UNABLE TO ESTABLISH FTP/KFTP CONNECTION	TBD
ALL FILE GROUPS/FILES NOT FOUND	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PDR matches the number of metadata files that were placed on the staging server;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
FTP/KFTP FAILURE	TBD
POST-TRANSFER FILE SIZE CHECK FAILURE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_SIZE accurately reflects the size(s) of the associated metadata file(s);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
FTP/KFTP COMMAND FAILURE	TBD
DUPLICATE FILE NAME IN GRANULE	<ul style="list-style-type: none"> <li>• make sure that the FILE_ID values in the PDR match the FILE_NAME values in the metadata file(s);</li> <li>• make sure you included the indication of what formats are in each metadata file in the file names (last character before the file extension: L7xxxpppprrryyyymmddf.MTA);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
METADATA PREPROCESSING ERROR	TBD
RESOURCE ALLOCATION FAILURE	TBD
ECS INTERNAL ERROR	TBD
DATA BASE ACCESS ERROR	TBD
INCORRECT NUMBER OF METADATA FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PDR matches the number of metadata files that were placed on the staging server;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INCORRECT NUMBER OF SCIENCE FILES	• does not apply to IGS
INCORRECT NUMBER OF FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PDR matches the number of metadata files that were placed on the staging server;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
DATA CONVERSION FAILURE	TBD
REQUEST CANCELLED	TBD
UNKNOWN DATA TYPE	<ul style="list-style-type: none"> <li>• make sure the value for DATA_TYPE is set to <b>L7IGS</b>;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID OR MISSING FILE TYPE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_TYPE accurately reflects whether the associated metadata file has both format 1 and 2 data in it (value should be set to <b>METADATA0</b>), only format 1 data in it (value should be set to <b>METADATA1</b>), only format 2 data in it (value should be set to <b>METADATA2</b>);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
FILE I/O ERROR	TBD

DATA ARCHIVE ERROR	TBD
--------------------	-----

**Table 5-5: Long PAN - Appropriate IGS Actions for Reported Dispositions**

Reported Disposition	Appropriate IGS Action
SUCCESSFUL	• no action required
NETWORK FAILURE	TBD
UNABLE TO ESTABLISH FTP/KFTP CONNECTION	TBD
ALL FILE GROUPS/FILES NOT FOUND	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PDR matches the number of metadata files that were placed on the staging server;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
FTP/KFTP FAILURE	TBD
POST-TRANSFER FILE SIZE CHECK FAILURE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_SIZE accurately reflects the size(s) of the associated metadata file(s);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
FTP/KFTP COMMAND FAILURE	TBD
DUPLICATE FILE NAME IN GRANULE	<ul style="list-style-type: none"> <li>• make sure that the FILE_ID values in the PDR match the FILE_NAME values in the metadata file(s);</li> <li>• make sure you included the indication of what formats are in each metadata file in the file names (last character before the file extension: L7xxxpppprrrryyyymmddf.MTA);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
METADATA PREPROCESSING ERROR	TBD
RESOURCE ALLOCATION FAILURE	TBD
ECS INTERNAL ERROR	TBD
DATA BASE ACCESS ERROR	TBD
INCORRECT NUMBER OF METADATA FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PDR matches the number of metadata files that were placed on the staging server;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INCORRECT NUMBER OF SCIENCE FILES	• does not apply to IGS
INCORRECT NUMBER OF FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PDR matches the number of metadata files that were placed on the staging server;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
DATA CONVERSION FAILURE	TBD
REQUEST CANCELLED	TBD
UNKNOWN DATA TYPE	<ul style="list-style-type: none"> <li>• make sure the value for DATA_TYPE is set to <b>L7IGS</b>;</li> <li>• correct and resubmit the PDR and the original files</li> </ul>
INVALID OR MISSING FILE TYPE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_TYPE accurately reflects whether the associated metadata file has both format 1 and 2 data in it (value should be set to <b>METADATA0</b>), only format 1 data in it (value should be set to <b>METADATA1</b>), only format 2 data in it (value should be set to <b>METADATA2</b>);</li> <li>• correct and resubmit the PDR and the original files</li> </ul>



FILE I/O ERROR	TBD
DATA ARCHIVE ERROR	TBD

**Table 5-6: Short Physical Media PDR Discrepancy - Appropriate IGS Actions for Reported Dispositions**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
INVALID FILE COUNT	<ul style="list-style-type: none"> <li>• make sure the parameter TOTAL_FILE_COUNT agrees with the number of files being submitted with this PMPDR (do not include the PMPDR in your count);</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
ECS INTERNAL ERROR	TBD
DATABASE FAILURES	TBD
INVALID PVL STATEMENT	<ul style="list-style-type: none"> <li>• check all statements in the PMPDR for correct format and syntax;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
MISSING OR INVALID ORIGINATING_SYSTEM PARAMETER	<ul style="list-style-type: none"> <li>• make sure the value for ORIGINATING_SYSTEM is set to <b>IGSxxx</b> where xxx is the 3-letter ID for your station as listed in Table 3-2;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
DATA PROVIDER REQUEST THRESHOLD EXCEEDED	TBD
DATA PROVIDER VOLUME THRESHOLD EXCEEDED	TBD
SYSTEM REQUEST THRESHOLD EXCEEDED	TBD
SYSTEM VOLUME THRESHOLD EXCEEDED	TBD

**Table 5-7: Long Physical Media PDR Discrepancy - Appropriate IGS Actions for Reported Dispositions**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
SUCCESSFUL	<ul style="list-style-type: none"> <li>• no action required</li> </ul>
INVALID DATA TYPE	<ul style="list-style-type: none"> <li>• make sure the value for DATA_TYPE is set to <b>L7IGS</b>;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
INVALID DIRECTORY	<ul style="list-style-type: none"> <li>• does not apply</li> </ul>
INVALID FILE SIZE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_SIZE accurately reflects the size(s) of the associated metadata file(s) and browse file(s);</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
INVALID FILE ID	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_ID accurately reflects the name(s) of the metadata file(s) and browse file(s) associated with the PMPDR;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
INVALID NODE NAME	<ul style="list-style-type: none"> <li>• does not apply</li> </ul>
INVALID FILE TYPE	<ul style="list-style-type: none"> <li>• make sure the values for FILE_TYPE accurately reflect the type of file (metadata or browse) and the order of each on the tape;</li> <li>• make sure the value(s) for FILE_TYPE accurately reflects whether the associated metadata file has both format 1 and 2 data in it (value should be set to <b>METADATA0</b>), only format 1 data in it (value should be set to <b>METADATA1</b>), only format 2 data in it (value should be set to <b>METADATA2</b>);</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>

**Table 5-8: Short Physical Media PAN - Appropriate IGS Actions for Reported Dispositions**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
SUCCESSFUL	• no action required
NETWORK FAILURE	TBD
UNABLE TO ESTABLISH FTP/KFTP CONNECTION	TBD
ALL FILE GROUPS/FILES NOT FOUND	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PMPDR matches the number of metadata and browse files that were written on the tape;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
FTP/KFTP FAILURE	TBD
POST-TRANSFER FILE SIZE CHECK FAILURE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_SIZE accurately reflects the size(s) of the associated metadata and browse files;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
FTP/KFTP COMMAND FAILURE	TBD
DUPLICATE FILE NAME IN GRANULE	<ul style="list-style-type: none"> <li>• make sure that the FILE_ID values in the PMPDR match the FILE_NAME and the BROWSE_FILE_NAME values in the metadata file(s);</li> <li>• make sure you included the indication of what formats are in each metadata file in the file names (last character before the file extension: L7xxxpprrrryyyymmddf.MTA);</li> <li>• make sure the file extension on the browse file names is incremented for each browse file in the subinterval (L7xxxpprrrryyyymmdd.Rnn);</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
METADATA PREPROCESSING ERROR	TBD
RESOURCE ALLOCATION FAILURE	TBD
ECS INTERNAL ERROR	TBD
DATA BASE ACCESS ERROR	TBD
INCORRECT NUMBER OF METADATA FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PMPDR matches the number of metadata <b>and</b> browse files that were written to the tape;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
INCORRECT NUMBER OF SCIENCE FILES	• does not apply to IGS
INCORRECT NUMBER OF FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PMPDR matches the number of metadata and browse files that were written to the tape;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
DATA CONVERSION FAILURE	TBD
REQUEST CANCELLED	TBD
UNKNOWN DATA TYPE	<ul style="list-style-type: none"> <li>• make sure the value for DATA_TYPE is set to <b>L7IGS</b>;</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
INVALID OR MISSING FILE TYPE	<ul style="list-style-type: none"> <li>• make sure the values for FILE_TYPE accurately reflect the type of file (metadata or browse) and the order of each on the tape;</li> <li>• make sure the value(s) for FILE_TYPE accurately reflects whether the associated metadata file has both format 1 and 2 data in it (value should be set to <b>METADATA0</b>), only format 1 data in it (value should be set to <b>METADATA1</b>), only format 2 data in it (value should be set to <b>METADATA2</b>);</li> <li>• correct and resubmit the PMPDR and the original files via tape</li> </ul>
FILE I/O ERROR	TBD
DATA ARCHIVE ERROR	TBD

**Table 5-9: Long Physical Media PAN - Appropriate IGS Actions for Reported Dispositions**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
SUCCESSFUL	<ul style="list-style-type: none"> <li>• no action required</li> </ul>
NETWORK FAILURE	TBD
UNABLE TO ESTABLISH FTP/KFTP CONNECTION	TBD
ALL FILE GROUPS/FILES NOT FOUND	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PMPDR matches the number of metadata and browse files that were placed on the staging server;</li> <li>• make sure that the files were written to the tape in the same order as listed in the PMPDR;</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
FTP/KFTP FAILURE	TBD
POST-TRANSFER FILE SIZE CHECK FAILURE	<ul style="list-style-type: none"> <li>• make sure the value(s) for FILE_SIZE accurately reflects the size(s) of the associated metadata and browse files;</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
FTP/KFTP COMMAND FAILURE	TBD
DUPLICATE FILE NAME IN GRANULE	<ul style="list-style-type: none"> <li>• make sure that the FILE_ID values in the PMPDR match the FILE_NAME and the BROWSE_FILE_NAME values in the metadata file(s);</li> <li>• make sure you included the indication of what formats are in each metadata file in the file names (last character before the file extension: L7xxxpprrrryyyymmddf.MTA);</li> <li>• make sure the file extension on the browse file names is incremented for each browse file in the subinterval (L7xxxpprrrryyyymmdd.Rnn);</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
METADATA PREPROCESSING ERROR	TBD
RESOURCE ALLOCATION FAILURE	TBD
ECS INTERNAL ERROR	TBD
DATA BASE ACCESS ERROR	TBD
INCORRECT NUMBER OF METADATA FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PMPDR matches the number of metadata <b>and browse</b> files that were written to the tape;</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
INCORRECT NUMBER OF SCIENCE FILES	<ul style="list-style-type: none"> <li>• does not apply to IGS</li> </ul>

**Table 5-9: Long Physical Media PAN - Appropriate IGS Actions for Reported Dispositions (Continued)**

<b>Reported Disposition</b>	<b>Appropriate IGS Action</b>
INCORRECT NUMBER OF FILES	<ul style="list-style-type: none"> <li>• make sure that the number of files identified by the parameter TOTAL_FILE_COUNT in the PMPDR matches the number of metadata and browse files that were written to the tape;</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
DATA CONVERSION FAILURE	TBD
REQUEST CANCELLED	TBD
UNKNOWN DATA TYPE	<ul style="list-style-type: none"> <li>• make sure the value for DATA_TYPE is set to <b>L7IGS</b>;</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
INVALID OR MISSING FILE TYPE	<ul style="list-style-type: none"> <li>• make sure the values for FILE_TYPE accurately reflect the type of file (metadata or browse) and the order of each on the tape;</li> <li>• make sure the value(s) for FILE_TYPE accurately reflects whether the associated metadata file has both format 1 and 2 data in it (value should be set to <b>METADATA0</b>), only format 1 data in it (value should be set to <b>METADATA1</b>), only format 2 data in it (value should be set to <b>METADATA2</b>);</li> <li>• correct the error;</li> <li>• generate a new PMPDR for the file group(s) that contained the error;</li> <li>• submit the new PMPDR and the associated metadata and browse files via tape</li> </ul>
FILE I/O ERROR	TBD
DATA ARCHIVE ERROR	TBD

## 5.6 Handling of Sensitive Data

Sensitive data related to the interface between the DAAC and the IGSs are the user account password, domain name, and IP address. These are specified in a separate attachment to this document. Each station, after signing on to become a Landsat 7 IGS, is sent a private attachment containing the sensitive data items required by the IGS to access to the staging server for metadata delivery. This sensitive data is sent via a postal service and will not be sent electronically. The address provided by the IGSs in Section 7 is used.

Passwords will be updated periodically via an update to the attachment. The update will be sent in the same manner as the original attachment.

## Section 6. FOT Points of Contact

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**For mission scheduling problems, concerns, or questions, contact the following:**

During prime shift (1200Z through 2300Z):

Michele Reeley	Mission Planner
Rich Lonigro	Mission Planner
Phone	(301) 614-5203 or (301) 614-5541
Pager	(301) 303-9284
FAX	(301) 614-5263
E-mail	Michele.Reeley@gsfc.nasa.gov Rich.lonigro@gsfc.nasa.gov
Mail Code	430.1
Address	GSFC/NASA Bldg. 32, Rm. C211 Greenbelt MD, 20771

During off-shift hours (2300Z through 1200Z), contact:

Senior real-time engineer

Phone (301) 614-5202

**In all other cases, contact the Mission Management Office. (See section 8.)**

# Section 7. IGS Points of Contact

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(The following information is TBS for each IGS.)

Country:	_____	
Station:	_____	
Name & Title:	_____	(Administrative Manager)
Phone:	_____	
Fax:	_____	
E-mail:	_____	
Address:	_____	
	_____	
	_____	

Name & Title:	_____	(Operations Manager)
Phone:	_____	
Fax:	_____	
E-mail:	_____	
Address:	_____	
	_____	
	_____	

## Section 8. MMO Points of Contact

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Web Address: <http://www.nnic.noaa.gov/SOCC/17noaa.html>

Name & Title: Jim Ellickson, Chief, Landsat Operations

Phone: 301-286-8311

Fax: 301-286-1744

Pager: TBD

E-mail: [jellickson@nesdis.noaa.gov](mailto:jellickson@nesdis.noaa.gov)

Address: Landsat 7 Project, Code 430  
GSFC  
Greenbelt, MD 20771

Name & Title: Kirk Liang, Flight Operations Manager

Phone: 301-286-8930

Fax: 301-286-1744

Pager: TBD

E-mail: [kliang@nesdis.noaa.gov](mailto:kliang@nesdis.noaa.gov)

Address: Landsat 7 Project, Code 430  
GSFC  
Greenbelt, MD 20771

Name & Title: Rebecca Farr, Ground Data Operations Manager

Phone: 301-286-3705

Fax: 301-286-1744

Pager: 301-701-0074

E-mail: [rafarr@nesdis.noaa.gov](mailto:rafarr@nesdis.noaa.gov)

Address: Landsat 7 Project, Code 430  
GSFC  
Greenbelt, MD 20771

Name & Title: Carmella Watkins, Applications and Customer Affairs

Phone: 301-286-5320

Fax: 301-286-1744

E-mail: [cwatkins@nesdis.noaa.gov](mailto:cwatkins@nesdis.noaa.gov)

Address: Landsat 7 Project, Code 430  
GSFC  
Greenbelt, MD 20771



## Section 9. DAAC Points of Contact

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### **Mailing address for physical media:**

USGS / EROS Data Center  
Mundt Federal Building  
Sioux Falls, SD 57198  
Attn: Mike Benson, EDC DAAC Production and Distribution Manager

### **Regarding electronic transfer or physical media problems:**

Name & Title: Mike Benson, EDC DAAC Production and Distribution Manager  
Lyn Oleson, EDC DAAC Manager  
Phone: 605-594-6938 or 605-594-6164  
Fax: 605-594-6567  
Pager: TBD  
E-mail: [benson@edcmail.cr.usgs.gov](mailto:benson@edcmail.cr.usgs.gov)  
Address: USGS / EROS Data Center  
Mundt Federal Building  
Sioux Falls, SD 57198

### **Regarding archive queries:**

Name & Title: User Services  
Phone: 605-594-6151  
Fax: 605-594-6567  
Pager: TBD  
E-mail: TBD  
Address: USGS / EROS Data Center  
Mundt Federal Building  
Sioux Falls, SD 57198

**In all other cases, contact the Mission Management Office. (See section 8.)**

# Abbreviations and Acronyms

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ATSC	AlliedSignal Technical Services Corporation
BME	Brower Mean Element
CCB	Configuration Control Board
CCR	Configuration Change Request
cd	Change Directory
DAAC	Distributed Active Archive Center
DC	District of Columbia
DCN	Document Change Notice
DMR	Detailed Mission Requirements
EDC	EROS Data Center
EOSDIS	Earth Observing System Data and Information System
EROS	Earth Resources Observation System
ETM+	Enhanced Thematic Mapper Plus
FOP	Flight Operations Plan
FORMATS	Flight Dynamics Facility Orbital and Mission Aids Transformation System
FOT	Flight Operations Team
ftp	File Transfer Protocol
GMT	Greenwich Mean Time
GSFC	Goddard Space Flight Center
ICD	Interface Control Document
ID	Identification
IGS	International Ground Stations
IIRV	Improved Interrange Vector
IP	Internet Protocol
LCG	Landsat Coordinating Group
LGSOWG	Landsat 7 Ground Station Operators Working Group
LPM	Landsat Program Management

LS7	Landsat 7
LTWG	Landsat Technical Working Group
MD	Maryland
MMO	Mission Management Office
MOC	Mission Operations Center
MOU	Memorandum of Understanding
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NESDIS	National Environmental Satellite, Data, and Information Service
NOAA	National Oceanic and Atmospheric Administration
NORAD	North American Air Defense
OA	Operations Agreement
PAN	Production Acceptance Notification
PC	Personal Computer
PDR	Product Delivery Record
PDRD	Product Delivery Record Discrepancy
PMPAN	Physical Media Production Acceptance Notification
PMPDR	Physical Media Product Delivery Record
PMPDRD	Physical Media PDR Discrepancy
PVL	Parameter Value Language
RF	Radio Frequency
SD	South Dakota
TBD	To Be Determined
TBS	To Be Supplied
U.S.	United States
USGS	United States Geological Survey
Z	Zulu time (same as GMT)

## Distribution List

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<b>Organization</b>	<b>Name of Recipient</b>	<b>Copies</b>
LMMS	Arvidson, Terry	1
USGS	Benson, Mike	1
FOT	Collier, Tegan	1
FOT	Cooke, Tom	1
NOAA	Ellickson, Jim	1
NOAA	Farr, Becky	1
GSFC Code 430.1	Gehr, Vic	1
FOT	L7 FOT Library	1
FOT	L7 MOR	2
GSFC Code 430	L7 Project Library	1
NOAA	Liang, Kirk	1
GSFC Code 430	Menrad, Bob	1
FOT	Nutwell, Gary	1
FOT	Odendahl, Steve	1
USGS	Oleson, Lyn	1
FOT	Sapper, Rusty	1
USGS	Schuldes, Mike	1
GSFC Code 430	Wong, Hank	1